

### IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (currently amended): An outer tube, ~~which is~~ comprising:

a body made of silicon carbide, and which has configured to be used in a thermal treatment system and having an upper portion, closed and a lower portion opened and a flange, [[has]] wherein the upper portion is closed, the lower portion is open and is formed with a tapered portion so as to expand expanding a diameter thereof toward a lower end thereof of the body, and has a the flange is formed on an outer peripheral side of the lower portion,[[;]] and the following conditions [[being]] are met:

- 1) a ratio of  $t_a/D_1$  is from 0.0067 to 0.025,
- 2) a product of  $t_a \times D_1$  is from 600 to 4,000 ( $\text{mm}^2$ ),
- 3)  $(D_{F2}-D_{F1}) \times t_c / (D_1 \times t_a)$  is from 0.1 to 0.7, and
- 4)  $L_1/L_2$  is from 1 to 10;

where the ~~outer lower tube portion~~ portion has a thickness of  $t_a$  (mm) and an inner diameter of  $D_1$  (mm), the flange has a thickness of  $t_c$  (mm), an inner diameter of  $D_{F1}$  (mm) and an outer diameter of  $D_{F2}$  (mm), and the tapered portion ~~has~~ tapers such that the lower portion is expanded from the inner diameter  $D_1$  to the inner diameter  $D_{F1}$  over a height  $L_1$  (mm) and an expanse of  $L_2$  (mm), and where the outer tube is configured to be used in a thermal treatment system.

Claim 2 (original): The outer tube according to Claim 1, wherein the tapered portion has upper and lower edges of an inner peripheral side rounded with a radius of 2 mm (R2) or above.

Claim 3 (original): The outer tube according to Claim 1, wherein the tapered portion has an inner surface having a surface roughness Ra of not greater than 7  $\mu\text{m}$ .

Claim 4 (currently amended): A thermal treatment system ~~[[using]]~~ comprising:

an outer tube, ~~which is made of silicon carbide, and which~~ wherein the outer tube has an upper portion, ~~closed and~~ a lower portion ~~opened~~ and a flange, [[has]] the upper portion is closed, the lower portion is open and is formed with a tapered portion ~~so as to expand~~ expanding a diameter thereof toward a lower end ~~thereof of the outer tube, and has a the~~ flange is formed on an outer peripheral side of the lower portion,[[;]] the following conditions ~~[[being]]~~ are met:

- 1) a ratio of  $t_a/D_1$  is from 0.0067 to 0.025,
- 2) a product of  $t_a \times D_1$  is from 600 to 4,000 ( $\text{mm}^2$ ),
- 3)  $(D_{F2} - D_{F1}) \times t_c / (D_1 \times t_a)$  is from 0.1 to 0.7, and
- 4)  $L_1/L_2$  is from 1 to 10;

where the ~~outer tube has~~ lower portion has a thickness of  $t_a$  (mm) and an inner diameter of  $D_1$  (mm), the flange has a thickness of  $t_c$  (mm), an inner diameter of  $D_{F1}$  (mm) and an outer diameter of  $D_{F2}$  (mm), and the tapered portion ~~[[has]]~~ tapers such that the lower portion is expanded from the inner diameter  $D_1$  to the inner diameter  $D_{F1}$  over a height  $L_1$  (mm) and an expanse of  $L_2$  (mm).

Claim 5 (original): The thermal treatment system according to Claim 4, wherein the tapered portion has upper and lower edges of an inner peripheral side rounded with a radius of 2 mm (R2) or above.

Claim 6 (original): The thermal treatment system according to Claim 4, wherein the tapered portion has an inner peripheral side having a surface roughness Ra of not greater than 7  $\mu\text{m}$ .

Claim 7 (original): The thermal treatment system according to Claim 4, wherein the height  $L_1$  of the tapered portion satisfies the relationship of  $H/4 < L_1 < 3 \cdot H/4$ , where a distance between a lowest end of a heater and a bottom surface of the outer tube is  $H$  (mm).

Claim 8 (new): An outer tube for a thermal treatment system, comprising:

a body made of silicon carbide, configured to surround an inner tube of a thermal treatment system and having an upper portion, a lower portion and a flange, wherein the upper portion is closed, the lower portion is open and is formed with a tapered portion expanding toward a lower end of the body, the flange is formed on an outer peripheral side of the lower portion, a ratio of  $t_a/D_1$  is from 0.0067 to 0.025, a product of  $t_a \times D_1$  is from 600 to 4,000 ( $\text{mm}^2$ ),  $(D_{F2}-D_{F1}) \times t_c / (D_1 \times t_a)$  is from 0.1 to 0.7, and  $L_1/L_2$  is from 1 to 10, where the lower portion has a thickness of  $t_a$  (mm) and an inner diameter of  $D_1$  (mm), the flange has a thickness of  $t_c$  (mm), an inner diameter of  $D_{F1}$  (mm) and an outer diameter of  $D_{F2}$  (mm), and the tapered portion tapers such that the lower portion is expanded from the inner diameter  $D_1$  to the inner diameter  $D_{F1}$  over a height  $L_1$  (mm) and an expanse of  $L_2$  (mm).